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selected for publication, but owing to the fact the December Number had to be cut short in order to get it out without further delay their solutions were omitted.—EDITOR.]

PROBLEMS.

25. **Proposed by M. A. GRUBER, A. M., War Department, Washington, D. C.**

Find, if possible, integral values of each of the seven linear measurements of a rectangular parallelopiped; i. e. length, breadth, height, the diagonals of each of the three different rectangular sides, and the diagonal from an upper corner to the opposite lower corner; or, find integral values, if possible, of a, b, c, d, e, f, and g, as shown in the equations,—$a^2+b^2=c^2$, $a^2+d^2=e^2$, $a^2+f^2=g^2$, $b^2+d^2=f^2$, $b^2+e^2=g^2$, $c^2+d^2=g^2$, $c^2+e^2=f^2$. If not possible, how many of them can have integral values? and which?

26. **Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.**

Find (1) a *square fraction* the arithmetical difference of whose terms is a *cube*; and (2) find a *cubic fraction* the arithmetical sum of whose terms is a *square*.

AVERAGE AND PROBABILITY.

Conducted by B. F. FINKEL, Kidder, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

12. **Proposed by Professor G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.**

A large plane area is ruled by two sets of parallel equidistant straight lines, the one set perpendicular to the other. The distance between any two lines of the first set is a; the distance between any two lines of the second set is b. If a regular polygon of $2n$ sides be thrown at random upon this area, find the chance that it will fall across a line, the diameter of the circum-circle of the polygon being less than a or b.

II. **Solution by H. W. DRAUGHON, Clinton, Louisiana.**

In the rectangle $ABCD$ let $AB=a$ and $AC=b$. Let c=apothem of polygon, and r=radius of its circum-circle.

Let the sides of the rectangle $EFIJ$, be parallel to, and distant c, from the corresponding sides of $ABCD$, and let the sides of the similarly